

MIS 6326 DATA MANAGEMENT

COMPANY:

Ticket Management System



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Problem Description

Problem Statement

Organizations need a way to efficiently deal with the issues and requests raised by their customers and other users of their services. The nature of the issues raised can vary greatly from organization to organization, and even within an organization from month to month and across the range of end users that the IT department supports. To ensure that all end-user issues are captured, matched, monitored, and recorded by the IT help desk or service desk a fit-for-purpose ticketing system is required.

Organization Description

Company Overview:

In an IT company there are huge number of issues and requests raised every minute. They can be categorised into software installation related tickets, hardware tickets, miscellaneous related tickets, and many more. These have to be carefully resolved by the appropriate experts to avoid any confusions.

Ticket Register

Having decided on appropriate ticket categorizations, the register can then be used to store important information regarding the tickets like the details of the employee who raised the particular ticket, type of the ticket, description, status of the ticket and details of ticket admin to whom the ticket has been assigned to.

Users

Employees(consumers)

The first type in users are the employees in the firm where in they can raise tickets as per their requirement like Software installation tickets, hardware upgrading requests, requesting for open network etc.

IT Engineers (Ticket Admins)

The second type of users are the IT experts who are going to resolve the issues raised by the employees. There are three levels of ticket admins, in case the issue was not resolved by the first level expert then it is escalated to the second level ticket admin and there might be cases where the issues cannot be resolved by second level admins due to lack of permissions and other dependencies, such tickets are addressed by third level ticket admins, the superior level.

Scope of Database

Ticket_users Table:

Ticket users table stores important information regarding the users(employees and ticket admins) like userid for tracking any specific user, first_name, last_name, telephone number, email, date of birth, address. Is_admin field is used to determine whether the user is an admin or a consumer.

Primary Key: user_id

Ticket_register Table:

Ticket register table is the heart of the database because all the critical information regarding the tickets are stored here. This table has details regarding the tickets like category_id, type_id describes the type of tickets, sev_id which tells us about the severity of the tickets, tik_status determines whether the ticket is open or resolved or escalated and tik_current_owner field tells us to whom the ticket is currently assigned to.

Primary Key: tik_entity_id

Foreign Key: category_id, type_id, sev_id, tik_userid, tik_name, tik_status, tik_current_owner

Ticket_workflow Table:

This table has details on the workflow on how a particular ticket is being resolved and the level of the ticket admin that is addressing the ticket. Type_id is a subset of the ticket_category, where in the tickets are categorised into different types.

Primary Key: workflow_id

Foreign Key: category_id, type_id, unit_id, level_one, level_two, level_three

Ticket_severity Table:

The following table informs about the severity of the particular ticket so that the ticket can be resolved on priority (eg: A virus in one of the systems is a very severe issue so it has to be resolved on priority). Deadline_days and created_date gives us details about the deadline and the day when the ticket was created.

Primary Key: sev_id

Foreign Key: category_id, type_id

Ticket_category Table:

This table stores the details of types of categories (eg: software, hardware etc) and created_date is the date the ticket was created.

Primary Key: category_id

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Ticket_status Table:

This table has details on status of the tickets, whether the tickets are closed, InProgress or escalated to a higher-level admin and each status has its corresponding status_id.

Primary Key: status_id

Ticket_units Table:

Units table has information about the unit name and address (Eg.If an IT company has many branches, then units can be defined as different branches located in different cities, or if we are referring to a single branch then unit can be listed as the floors in the particular company)

Primary Key: unit_id

User_to_site_map Table:

This table is a bridge table that links ticket_users and ticket_units table. It contains user_id and unit_id fields. It states how a user is related to a particular unit.

Primary Key: user_id, unit_id

Foreign Key: user_id, unit_id

Ticket_zip_city Table:

This table provides information about the ticket i.e from which city, state and zip the ticket originated from.

Primary Key: zip_code

Ticket_kdb Table:

The ticket_kdb is a knowledge database for the reference of admin users. Whenever there is a ticket raised (eg. Software issue/network issues) the admin searches whether the issue was addressed in the past and if there is a solution available.

Primary Key: kdb_id

Foreign Key: category_id, type_id

Entity Relationship Diagram

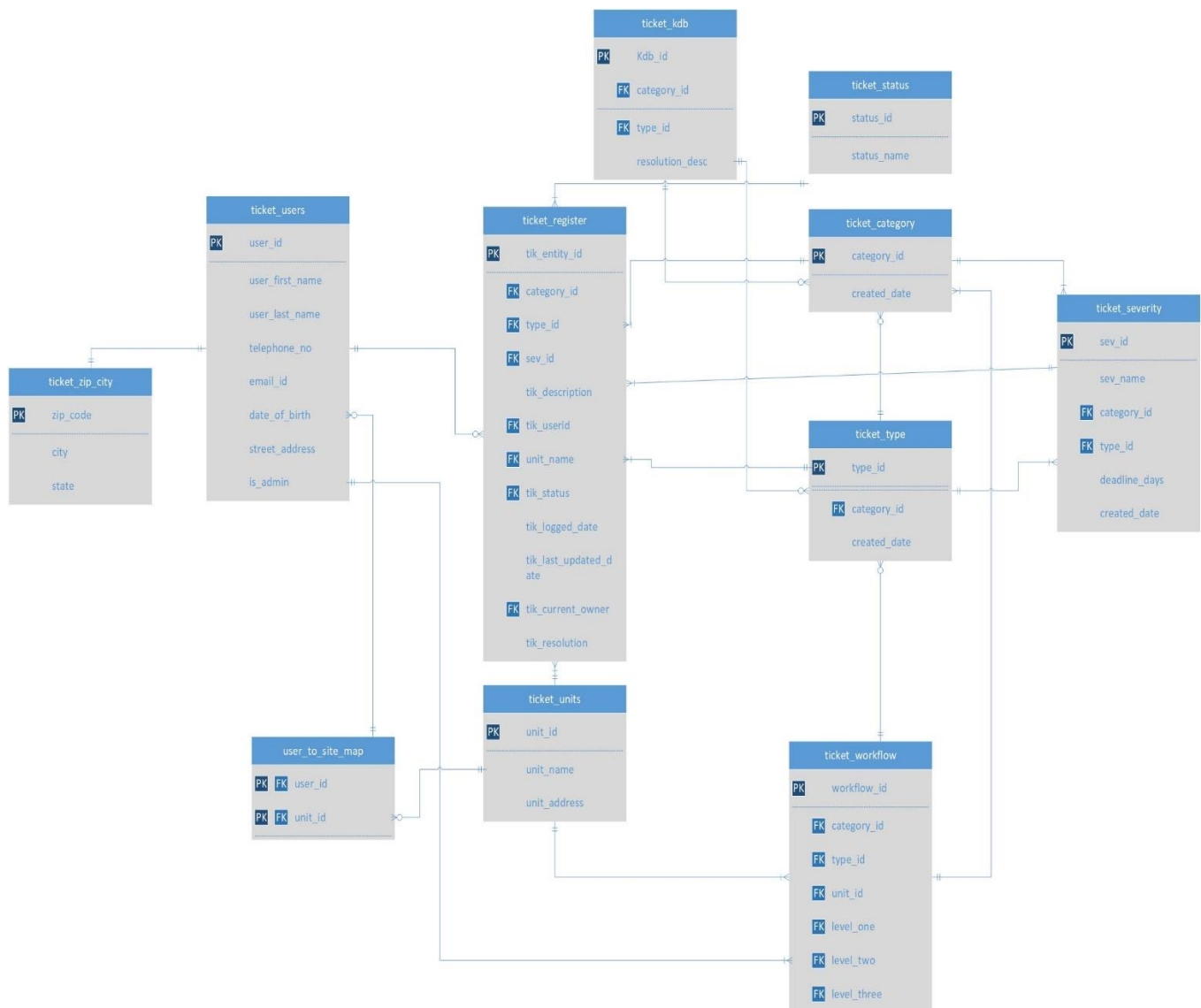


Figure 1: ERD-Ticket Management System

Relational Database Schema

Ticket_severity Table:

```
CREATE TABLE Ticket_severity (  
    Severity_ID int NOT NULL,  
    Severity_Name varchar(255) NOT NULL,  
    Category_ID int NOT NULL,  
    TicketType_ID int NOT NULL,  
    DeadLine_Days int NOT NULL,  
    Created_Date timestamp NOT NULL,  
    Row_Status varchar(255) NOT NULL,  
    PRIMARY KEY(Severity_ID),  
    FOREIGN KEY (Category_ID) REFERENCES Ticket_category(Category_ID),  
  
);  
  
ALTER TABLE Ticket_severity  
ADD FOREIGN KEY (TicketType_ID) REFERENCES Ticket_type(Category_ID);
```

Ticket_category Table:

```
CREATE TABLE Ticket_category(  
    Category_ID int NOT NULL,  
    Created_Date timestamp NOT NULL,  
    Row_Status varchar(255) NOT NULL,  
    PRIMARY KEY(Category_ID)  
  
);
```

Ticket_type Table:

```
CREATE TABLE Ticket_type(  
    TicketType_ID int NOT NULL,  
    Category_ID int NOT NULL,  
    Created_Date timestamp NOT NULL,  
    Row_Status varchar(255) NOT NULL,  
    PRIMARY KEY(TicketType_ID),  
    FOREIGN KEY (Category_ID) REFERENCES Ticket_category(Category_ID)  
  
);
```

Ticket_units Table:

```
CREATE TABLE Ticket_units(  
    Unit_ID int NOT NULL,  
    Unit_Name nvarchar ,  
    Unit_Address nvarchar,  
    Row_Status varchar(255) NOT NULL,  
    PRIMARY KEY(Unit_ID),  
  
);
```

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Ticket_zip_city Table:

```
CREATE TABLE Ticket_zip_city(  
    Zip_Code int NOT NULL,  
    CityName nvarchar(255),  
    StateName nvarchar(255),  
    PRIMARY KEY(Zip_Code),  
);
```

Ticket_users Table:

```
CREATE TABLE Ticket_users(  
    User_ID int NOT NULL,  
    User_FirstName nvarchar(255),  
    User_LastName nvarchar(255),  
    PhoneNumber bigint, Email nvarchar (255),  
    DOB date NOT NULL,  
    St_Address nvarchar(500),  
    IsAdmin Binary,  
    RowStatus nvarchar(255)  
    PRIMARY KEY(User_ID)  
);
```

Ticket_register Table:

```
CREATE TABLE Ticket_register(  
    Ticket_entityID bigint NOT NULL,  
    Category_ID int NOT NULL,  
    TicketType_ID int NOT NULL,  
    Severity_ID int NOT NULL,  
    Ticket_description nvarchar(750),  
    Ticket_userID int NOT NULL,  
    /*unitname*/  
    Ticket_status int NOT NULL,  
    Ticket_loggedDate timestamp NOT NULL,  
    Ticket_lastUpdatedDate timestamp NOT NULL,  
    /*Ticket_currentOwner  
    Ticket_resolution nvarchar*/  
    Ticket_rowStatus int Not NULL  
);
```


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User_to_site_map Table:

```
create table User_to_site_map(  
  user_id int REFERENCES Ticket_users(user_id),  
  unit_id int REFERENCES Ticket_units(unit_id),  
  rowstate int  
  CONSTRAINT [PK_User_to_site_map] PRIMARY KEY NONCLUSTERED  
(  
    user_id,  
    unit_id  
  ))
```

Ticket_kdb Table:

```
create table Ticket_kdb(  
  category_id int REFERENCES Ticket_category(category_id),  
  TicketType_ID int REFERENCES Ticket_type(TicketType_ID),  
  Resolution_desc varchar(500),  
  Row_status int  
  CONSTRAINT [PK_Ticket_kdb] PRIMARY KEY NONCLUSTERED  
(  
    category_id,  
    TicketType_ID  
  ))
```

Ticket_workflow Table:

```
create table Ticket_workflow(  
  Workflow_ID int,  
  Category_ID int,  
  TicketType_ID int,  
  Unit_ID int,  
  Row_Status int  
  Primary Key(Workflow_ID)  
  Foreign Key (Category_ID) references Ticket_category(Category_ID),  
  Foreign Key (TicketType_ID) references Ticket_type(TicketType_ID),  
  Foreign Key (Unit_ID) references Ticket_units(Unit_ID))
```

Ticket_register Table:

```
create table Ticket_register(  
  TicketEntity_ID int,  
  Category_ID int,
```

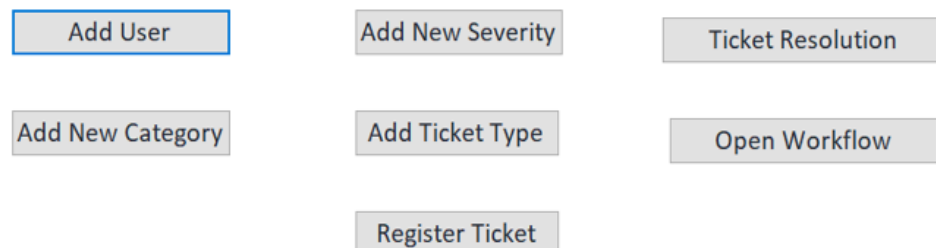
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```
TicketType_ID int,  
Severity_ID int,  
Ticket_desc nvarchar(300),  
Ticket_status nvarchar(200),  
Ticket_logged_date date,  
Ticket_lastupdated_date date,  
Ticket_currentowner_id int,  
Ticket_resloution nvarchar(500),  
Ticket_RowStatus int  
FOREIGN KEY (Category_ID) REFERENCES Ticket_category(Category_ID),  
FOREIGN KEY (TicketType_ID) REFERENCES Ticket_type(TicketType_ID),  
FOREIGN KEY (Severity_ID) REFERENCES Ticket_severity(Severity_ID),  
FOREIGN KEY (Ticket_currentowner_id) REFERENCES Ticket_users(user_id)  
);
```

Menu and DATA Input Forms

The following section includes descriptions and illustrations of the database Data Input Screens. Descriptions follow the print screen or illustration.

Main Menu



Main Menu: Contains buttons to add user information, severity, resolution, category, ticket type, workflow, and for registering tickets.

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User Information

First Name:

Last Name:

Phone Number:

Email:

DOB:

Street Address:

Are you an admin?

☒

Update

Add

Delete

User Information: This form allows users to add their details. These details are used for user tracking.

Category

Category Name

Hardware

Created Date

12/8/2019 8:45:56 PM

Add Category

Update Category


Delete Category


Category: This form allows users to add/update/delete the category of tickets/issues (Eg: hardware related, software related) and logs the date it was created.

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Type

Type Name


Category details: 

Created Date 

Type: This form asks the user to input about the type of issue. Types include connectivity issues, performance issues etc

Severity

Severity Name :

Category Name : 

TicketType Name :

DeadLine Days :

Created Date :

Severity: This form allows users to select the priority, this allows ticket admins to resolve the high priority issues as soon as possible

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Create a workflow

Category:	Hardware	▼
Type:	Connectivity issues	▼
Unit:	Austin Branch	▼
Level One:	Dallas Branch	
	Austin Branch	
Level Two:		▼
Level Three:		▼

Add a workflowUpdate WorkflowDelete Workflow

Workflow: This form allows users to select the level of admins that must look into the issue and also has an option to select the unit.

Log a ticket

Category:	Hardware	▼
Type:	Book meeting room	▼
Severity:	low	▼
Description:	high	
	low	
	low	
	Medium	
Logged Date	12/9/2019 7:59:14 PM	

RegisterUpdateDelete

Log a ticket: This form allows user to enter the ticket description, severity, type and category and log a ticket

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Share Your Resolution

Category :	<div>1</div>
Ticket Type :	<div><div>1</div>Hardware</div> <div><div>2</div>Software</div> <div><div>3</div>Transport</div>

Resolution: This form allows users to type in the steps to resolve the issues for different kinds of categories

Sample Reports

Main Menu

Add User	Add New Severity	Ticket Resolution
Add New Category	Add Ticket Type	Open Workflow
Register Ticket		

The following are the reports generated from the above forms

Ticket users						
User_FirstName	User_LastName	Phone No	Email	DOB	St_Address	.Admin
Lucius	Dorsey	4698633477	Aenean.euismod.mauris@dlamat.co.uk	26-Mar-97	5865 Faudibus Road	<input checked="" type="checkbox"/>
Curran	Nunez	4693598971	sapien.Aenean.massa@amlat.co.uk	11-Sep-77	P.O. Box 465, 5528 Accumsan Rd.	<input checked="" type="checkbox"/>
Xenos	Dorsey	4692768793	eu.euismod.ac@atarcuVestibulum.net	13-Jul-01	P.O. Box 277, 9975 Consequat Ave	<input checked="" type="checkbox"/>
Lucius	Velasquez	4692678488	Aenean.euismod.mauris@dlamat.co.uk	11-Mar-71	P.O. Box 286, 7473 Aliquam Road	<input checked="" type="checkbox"/>
Morgan	Nunez	4699668398	pede.et.risus@auctor.net	11-Sep-79	P.O. Box 345, 5609 Amet, Ave	<input checked="" type="checkbox"/>
Daquan	Pratt	4692304872	lectus@nonummy.org	27-Apr-06	171-5750 Fusce St.	<input checked="" type="checkbox"/>
Yetta	Fuentes	4699962214	mauris.sagittis@sempercursusInteger.org	29-Sep-88	Ap #199-4324 Lorem Ave	<input checked="" type="checkbox"/>
Chase	Carlson	4695440245	quis@neque.edu	07-Feb-96	P.O. Box 386, 4606 Facilisis Street	<input checked="" type="checkbox"/>
Aileen	Stephenson	4698818912	ut@conubia.edu	22-Mar-75	Ap #107-6475 Nec Avenue	<input checked="" type="checkbox"/>

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Ticket Category

Category_Name	Created_Date
Hardware	08-Dec-19 8:45:56 PM
Software	08-Dec-19 8:46:02 PM
Transport	08-Dec-19 8:46:07 PM



Ticket Type

Type_Name	Category_ID	Created_Date
Connectivity issues	1	08-Dec-19 8:52:41 PM
Network problems	1	08-Dec-19 8:54:30 PM
Change desktop	1	08-Dec-19 8:54:40 PM
Change lan cable	1	08-Dec-19 8:54:51 PM
Book meeting room	1	09-Dec-19 1:21:24 AM
Software request	2	09-Dec-19 1:22:36 AM
Beta issues	2	09-Dec-19 5:26:01 PM
Client Software	2	09-Dec-19 5:27:06 PM
Password reset/ unlock	2	09-Dec-19 5:27:07 PM
user account services	2	09-Dec-19 5:27:08 PM
cab required	3	09-Dec-19 5:27:09 PM
transport reimbursement	3	09-Dec-19 5:27:10 PM
flight ticket	3	09-Dec-19 5:27:11 PM



Ticket Severity

Severity_Name	Category_Name	TicketType_Name	DeadLine_Days	Created_Date
high	2	3	2	09-Dec-19 12:26:58 AM
low	2	2	2	09-Dec-19 12:29:35 AM
low	2	3	9	09-Dec-19 12:39:29 AM
Medium	2	2	12	09-Dec-19 4:05:01 PM

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Create Workflow

Category_ID	TicketType_ID	Unit_Name	LevelOne	LevelTwo	LevelThree
1	1	Austin Branch	8	7	6
1	2	Austin Branch	8	7	2
1	3	Austin Branch	7	10	9
1	4	Austin Branch	3	10	9
1	5	Austin Branch	2	4	4
2	6	Austin Branch	3	1	4
2	7	Austin Branch	8	9	6
2	8	Austin Branch	2	5	2
2	9	Austin Branch	9	3	2
2	10	Austin Branch	7	10	10
3	11	Austin Branch	7	8	6
3	12	Austin Branch	8	3	3
3	13	Austin Branch	8	8	3
1	1	Dallas Branch	3	6	4

Ticket Register

ID	Categor	Type	Sev	Desc	Status	Logged Date	Updated Date	Res
4	1	Book meeting room	10	Need Meeting room at 9 AM 10th December	New	12/9/2019 7:59:14 PM	12/9/2019 7:59:25 PM	Null
6	2	Password reset/ unlock	9	Reset my password	New	12/9/2019 8:31:46 PM	12/9/2019 8:31:56 PM	Null
7	1	Change desktop	10	My desktop doesn't work	New	12/9/2019 8:32:13 PM	12/9/2019 8:33:04 PM	Null
8	3	flight ticket	9	Book a ticket to Austin	New	12/9/2019 8:33:28 PM	12/9/2019 8:33:49 PM	Null
9	1	Change lan cable	9	Change my LAN Cable	New	12/9/2019 8:34:09 PM	12/9/2019 8:34:35 PM	Null
10	1	Change desktop	9	Need new PC	New	12/9/2019 8:35:12 PM	12/9/2019 8:36:26 PM	Null

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Ticket KDB

Category_id TicketType_ID Resolution_desc

1	1	Please check the internet connectivity settings from Windows->Troubleshoot settings
1	2	Please restart your modem.
2	9	Change your password from Control Panel->User Settings->Password Management->Forgot Password
2	7	Please reinstall the software
3	12	Raise reimbursement request on Employee portal.

CONTRIBUTIONS:

Name	Work Done
Spoorthi	Table Design & Forms
Pranav	ERD & Forms
Nikhil	Documentation & Form Reports
Mihir	Forms & Form Reports
Kunal	ERD & Table Design